REMARKS

This amendment is responsive to the Office action dated June 4, 2003. It amends claims 1, 49, 51, 68, and 69. Applicants respectfully request reexamination and reconsideration of claims 1 and 49-73.

With regard to paragraph nos. 1-2 of the Office action, the Examiner rejected claims 1, 49-53, 61-69, and 72-73 under 35 U.S.C. 112, second paragraph, as being indefinite.

The Examiner states there is an insufficient antecedent basis for the limitations "the epitaxial layers" and/or "adjacent epitaxial layers" recited in each of claims 1, 68, and 69. Applicants have amended claims 1, 68, and 69 to delete the term "epitaxial" so that each of the claim limitations has an antecedent basis. Specifically, "growing one or more layers" is the antecedent basis for "one or more of the layers adjacent the Si-Ge-C layer" and "one or more of the layers adjacent the Si-Ge-C layer" recited in amended claims 1, 68, and 69. Applicants also amend claims 49 and 51 in similar manner so as to be consistent with base claim 1.

The Examiner states that the U.S. Application No. 08/336,949 indicates that Si-Ge-C may not be epitaxial at certain concentrations of carbon. Claims 1, 68, and 69 are not limited to growing Si-Ge-C epitaxial layers. The Si-Ge-C can be epitaxial or non-epitaxial depending on the process and carbon concentration (See Figure 15 of the present application). Further, it is not the function of the claims to show that a technological discontinuity (e.g., from epitaxial to non-epitaxial) exists between the invention and the subject matter just outside the claims. *See, Andew Corp. V. Gabriel Elec., Inc.,* 847 F. 2d 819, 6 USPQ 2d 2010 (Fed. Circ. 1988). Thus, claims 1, 68, and 69 encompass Si-Ge-C layers of either morphology.

The Examiner states claims 61, 72, and 73 recite "one or more layers adjacent to the Si-Ge-C layer" and it is unclear if it refers to the grown layers beginning on line 3 or other layers which are being introduced for the first time. Applicants note that the one or more

layers adjacent are the grown layers beginning on line 3. Thus, "growing one or more layers" is the antecedent basis for "one or more of the layers adjacent the Si-Ge-C layer" and "one or more of the layers adjacent the Si-Ge-C layer" recited in claims 61, 72, and 73. Applicants respectfully submit claims 1, 49-53, 61-69, and 72-73 now comply with 35 U.S.C. 112, second paragraph.

With regard to paragraph no. 4 of the Office action, the Examiner rejected claims 68 and 69 under 35 U.S.C. 102(e) as being anticipated by U.S. Patent No. 5,357,899 to Bassous et al. Because Bassous et al. do not describe growing a Si-Ge-C layer, wherein the carbon of the Si-Ge-C layer is an amount from 1 to 10 atomic percent, Bassous et al. cannot anticipate amended claim 68 or 69.

Bassous et al. do not teach or suggest a Si-Ge-C layer, wherein the carbon of the Si-Ge-C layer is an amount from 1 to 10 atomic percent. Instead, Bassous et al. describe the low temperature chemical vapor deposition of a silicon layer doped with boron in a concentration range greater than 2 x 10 exp 20 atoms of boron per cubic centimeter of silicon or with germanium in a concentration range greater than 5 x 10 exp 20 atoms of germanium per cubic centimeter of silicon, or with a combination of boron and germanium in these concentration ranges (See Abstract, col. 3, lines 1-20, col. 4, lines 48-53).

With regard to how much greater the boron concentration is in the epitaxial layer, Bassous et al. state that boron doped epitaxial layers are "virtually unetchable" in hot concentrated KOH solutions if the boron dopant concentration is greater than or equal to 5 x 10 exp 20, which is 1 atomic percent. There is no motive for one of ordinary skill to go above this 1 atomic percent concentration of boron, however, since higher concentrations of boron would raise costs with no apparent benefit.

Bassous et al. fail to teach an amount of carbon within the Si-Ge-C layer, merely that carbon may be used. Bassous et al. do not disclose how much carbon would be suitable to achieve the desired amount of etch selectivity. Instead Bassous et al. state

that carbon, like boron, is suitable for stress compensation of the lattice (col. 3, 1-20). If carbon, known to have a smaller atomic radius than boron, were to replace boron as the dopant, a lower percentage of carbon would generate the same amount of tensile stress. It is therefore submitted that Bassous et al. do not disclose, mention or suggest a method for using Si-Ge-C where the carbon is from 1 to 10 atomic percent in selective etch applications in accordance with the invention and therefore the inventions recited in amended claims 68 and 69 are novel and unobvious over Bassous et al.

With regard to paragraph nos. 5-6 of the Office action, the Examiner rejected claims 1, 49-67 and 70-72 under 35 U.S.C. 103 as being unpatentable over U.S. Patent No. 5,357,899 to Bassous et al. in view of Tong et al., *Etch-Stop Layers in Silicon Produced By Implantation of Electrically Inactive Impurities (1992)*(hereinafter "Tong"). Specifically the Examiner asserts that Bassous et al. disclose much of what is recited in these claims such as Si-Ge-C layers being sufficient for etch selectivity and relative etch rates in column 5, lines 55-56, column 3, lines 1-20, column 2, lines 54-66, column 5, lines 55-65, Figure 1B, and Figure 1C.

Applicant respectfully submit that Bassous et al. describe Si-Ge-B and only mention in passing, column 3, lines 1-20, that carbon, like boron, is suitable for stress compensation of the lattice. If carbon, known to have a smaller atomic radius than boron, were to replace boron as the dopant, a lower percentage of carbon would generate the same amount of tensile stress.

The Examiner concedes that Bassous et al. do not teach the amount of carbon in the etch stop layer but asserts that Tong teaches Si-C, Si-Ge, and Si-Ge-C with 5% and 10% carbon as an etch stop layer relative to silicon using a liquid etchant (See Abstract, Introduction, and pages 397-399).

Tong describes heavily boron doped silicon or implanting silicon with nitrogen or oxygen on pages 384-385 (Abstract). Tong also describes implanting electrically inactive impurities (i.e., carbon, argon, neon, silicon and germanium) in silicon. On page 397,

Tong mentions implanting silicon with germanium at 200 KeV and dose of 1E15/cm2 and carbon implantation at 44 KeV to produce the same projected range, but states smaller carbon atoms perform stress compensation that reduces etch-stop efficiency. Tong mentions 5% and 10% carbon only in the context of Si-C not in the context of Si-Ge-C (pages 398-399). The layers for which Tong mentions the above 5% and 10% carbon (pp. 398, 399) contain two or more phases, and are part of a microstructure containing several layers. The 5% and 10% C compositions refer to only a single phase in the multi-phase, multi-layer matrix. Tong does not sort out the etch selectivity of specific layers or phases so does not know the etch selectivity of the phases containing 5% and 10% C. Thus, Tong does not discuss the growth of Si-Ge-C or motivate one of ordinary skill to spend effort in this area to arrive at the recited ranges. Thus, the claims would have been unobvious over Bassous et al. and Tong.

With regard to paragraph no. 7, the Examiner rejected claims 1 and 49-73 for obviousness type double patenting over claims 1-6 of U.S. Patent No. 5,906,708. In response, applicants will if all patent owners consent file a terminal disclaimer to obviate this rejection once the Examiner states the all claims are otherwise patentable.

In view of the above, applicants submit the application is in condition for allowance. Please call if you have any question, comment, or it will expedite prosecution.

Respectfully Submitted,

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Rewritten claims 1, 49, 51, 68, and 69 in marked up form:

1. (Twice Amended) A method of using Si-Ge-C in selective etch applications, comprising:

growing one or more layers on a single crystal silicon substrate, at least one of which is a Si-Ge-C layer, wherein the carbon of the Si-Ge-C layer is an amount from 1 to 10 atomic percent and sufficient to exhibit etch selectivity with respect to the single crystal silicon substrate and/or one or more of the ~~epitaxial~~ layers adjacent the Si-Ge-C layer; and

etching with a liquid etchant, the Si-Ge-C layer and the single crystal silicon substrate and/or one or more of the ~~epitaxial~~ layers adjacent the Si-Ge-C layer.

49. (Amended) The method of claim 1, wherein the Si-Ge-C layer etches slower than the one or more adjacent ~~epitaxial~~ layers.

51. (Amended) The method of claim 1, wherein the Si-Ge-C layer etches faster than the one or more adjacent ~~epitaxial~~ layers.

68. (Amended) A method of using Si-Ge-C in selective etch applications, comprising:

growing one or more layers on a single crystal silicon substrate, at least one of which is a Si-Ge-C layer, wherein the carbon of the Si-Ge-C layer is in an amount from 1 to 10 atomic percent and sufficient to exhibit etch selectivity with respect to the single crystal silicon substrate and/or one or more of the ~~epitaxial~~ layers adjacent the Si-Ge-C layer; and

etching with a liquid etchant, the Si-Ge-C layer and the single crystal silicon substrate and/or one or more of the ~~epitaxial~~ layers adjacent the Si-Ge-C layer wherein the Si-Ge-C layer etches slower than the one or more adjacent ~~epitaxial~~ layers.

69. (Amended) A method of using Si-Ge-C in selective etch applications, comprising:

growing one or more layers on a single crystal silicon substrate, at least one of which is a Si-Ge-C layer, wherein the carbon of the Si-Ge-C layer is in an amount from 1 to 10 atomic percent and sufficient to exhibit etch selectivity with respect to the single crystal silicon substrate and/or one or more of the ~~epitaxial~~ layers adjacent the Si-Ge-C layer; and

etching with a liquid etchant, the Si-Ge-C layer and the single crystal silicon substrate and/or one or more of the ~~epitaxial~~ layers adjacent the Si-Ge-C layer wherein the Si-Ge-C layer etches faster than the one or more adjacent ~~epitaxial~~ layers.